

# (12) UK Patent Application (19) GB (11) 2 283 881 (13) A

(43) Date of A Publication 17.05.1995

(21) Application No 9422816.0

(22) Date of Filing 11.11.1994

(30) Priority Data

(31) 9323357

(32) 12.11.1993

(33) GB

(71) Applicant(s)

SDX Business Systems Limited

(Incorporated in the United Kingdom)

Sterling Court, 15-21 Mundells,  
WELWYN GARDEN CITY, Hertfordshire, AL7 1LZ,  
United Kingdom

(72) Inventor(s)

Michael Bryan Davison

(74) Agent and/or Address for Service

Gill Jennings & Every  
Broadgate House, 7 Eldon Street, LONDON,  
EC2M 7LH, United Kingdom

(51) INT CL<sup>6</sup>

H04Q 7/24, H04M 3/42

(52) UK CL (Edition N )

H4K KF42

H4L LDJ

(56) Documents Cited

GB 2253119 A

(58) Field of Search

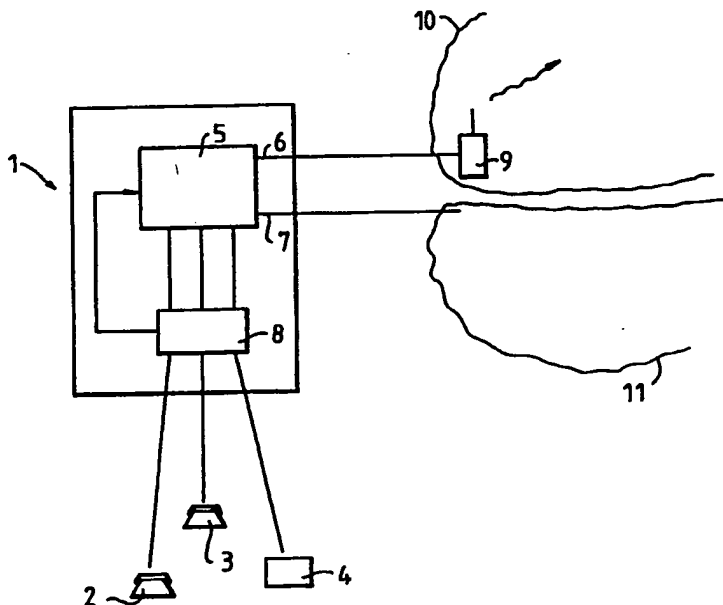
UK CL (Edition N ) H4K KF42, H4L LDJ

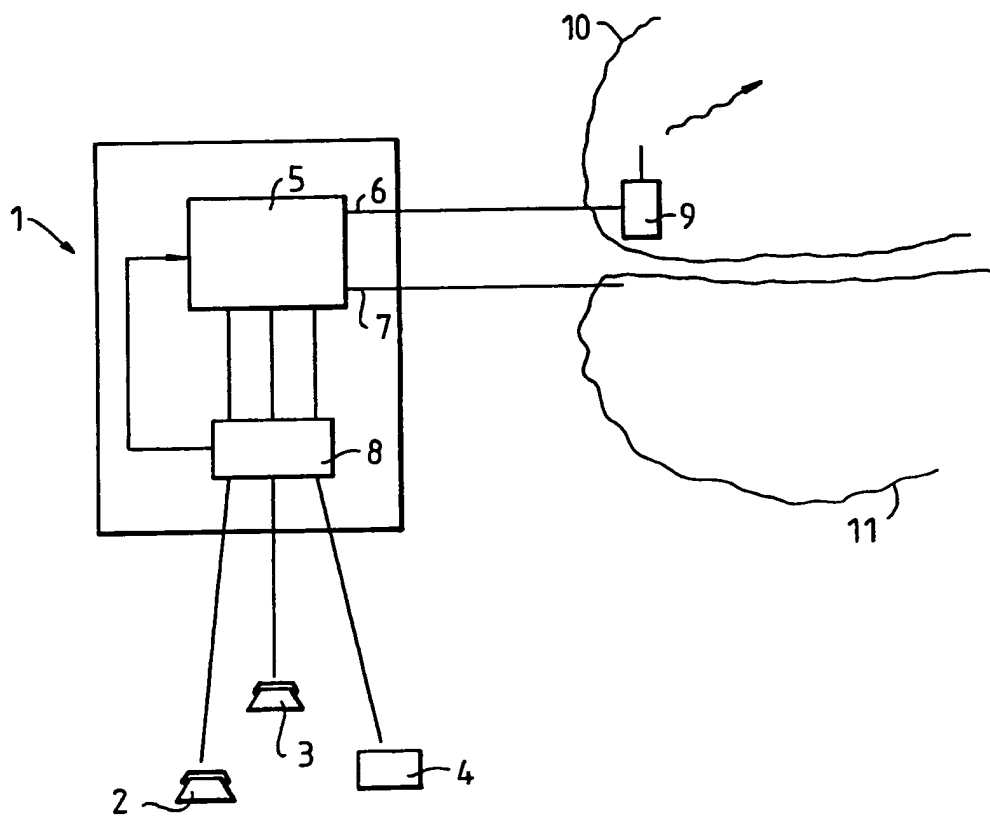
INT CL<sup>6</sup> H04M, H04Q

Online databases: WPI

## (54) Telephone communications assembly

(57) A telephone communications assembly comprises a switch (5) having at least two extension ports (2, 4) and at least one trunk line port (6, 7) connectable to the extension ports. A telephone transmitting and receiving device (9) is connected to one of the trunk line ports (6), the device being adapted for use directly in a public, non-wired communication network.





TELEPHONE COMMUNICATIONS ASSEMBLY

(  
The invention relates to a telephone communications assembly comprising a switch having at least two extension ports and at least one trunk line port connectable to the extension ports.  
5

Assemblies incorporating such switches are known in the form of private branch exchange equipment (PBX) and the like and conventionally such equipment is connected via the or each trunk line port to a public switched telephone network (PSTN).  
10

One problem which arises with conventional private branch exchange equipment is linking that equipment to a PSTN when the equipment is inaccessible by cable or where a microwave link is not cost-effective. In such situations, the use of a PBX is not possible.  
15

One approach to solving this problem is described in US-A-4890315. This describes the connection of a switch to a radio telephone which communicates with a remote base station which in turn is connected to a land line telephone system. The drawback of this approach is that a specialised radio communication link must be set up between the remote units and effectively this constitutes a radio communication tied line. Communication bandwidth is limited.  
20  
25

In accordance with the present invention, a telephone communications assembly comprises a switch having at least two extension ports and at least one trunk line port connectable to the extension ports; and a telephone transmitting and receiving device connected to the or one of the trunk line port(s), the device being adapted for use directly in a public, non-wired communication network.  
30

We have realised that it is possible to connect a private branch exchange switch directly to a telephone device, such as a mobile or cellular telephone device, using an existing approved trunk line interface and hence enable land line based extensions to use the public, non-  
35

wired network directly. This enables the problems outlined above to be overcome and also avoids the need to use an intermediate PSTN with the result that the cost of accessing someone having a mobile telephone, for example, is reduced. A further advantage is that the assembly is substantially self-contained and can be moved from building to building without the need for physical connections to an outside carrier.

This is particularly useful in the case of building sites, for example. Typically, a portable office is taken to a building site. The office will include a PBX and a number of extensions and conventionally has to be connected to a specially provided, land line based trunk. The invention avoids this altogether by linking the PBX into a mobile telephone device which are carried together in the portable office.

Another important application is in building security where conventionally an alarm is connected to the switch so as to call a remote telephone when activated. This has the drawback that the land line telephone can be cut thus preventing the remote alarm call. With the invention this problem is overcome by avoiding use of the land line.

In some cases, the assembly may further comprise a second trunk line port connected to another telephone communications network. This might be, for example, a hard wired connection of a conventional type. In that case, preferably, the switch further includes a detector for detecting the destination of a call from an extension port and causing the switch to route the call to one or other of the trunk line ports as appropriate. Thus, if the destination is a telephone within the mobile telephone network then the switch will route the call via the first trunk line port but otherwise via the second trunk line port.

An example of a telephone communications assembly according to the invention will now be described with

reference to the accompanying drawing which is a schematic, block diagram.

The drawing illustrates a private branch exchange switch 1 connected to a number of extensions, of which three are shown 2-4. These can be any form of telephone communication device and are shown in this example as telephone handsets 2,3 and a fax machine 4. The switch 1 includes a switch unit 5 connected to a pair of trunk line ports 6,7 and to the extensions 2-4 via a switch controller 8. The switch unit 5 is able to route calls between any of the extensions 2-4 and either of the trunk line ports 6,7 and in either direction.

The trunk line port 6 is connected directly to a mobile telephone 9 forming part of a cellular PSTN 10. The mobile telephone 8 is shown in the drawing as being a separate unit from the switch 1 although in practice it may be embodied within the switch assembly and not be separately movable. The trunk line port 7 is connected via a hard wired connection or radio link to a conventional PSTN network 11.

In operation, a user dials a desired number on one of the extension devices, for example the device 2. The dialled telephone number is sensed by the controller 8 within the switch 1 and the controller determines in a conventional manner, from the first few digits, whether the called telephone is within the mobile telephone network 10 or not. If it is within the mobile telephone network, then the controller 8 actuates the switch unit 5 to route the call to the trunk line port 6 and hence to the mobile telephone unit 9. The unit 9 then dials the appropriate number as supplied from the extension 2 and switch unit 5 so that the call is initiated directly in the mobile telephone network. If the called telephone is not within the mobile telephone network then the controller 8 causes the switch unit 5 to route the call via the trunk line port 7 to the conventional PSTN 11.

In other applications, only the port 6 is provided so  
that all calls are routed via the mobile telephone 9.

CLAIMS

1. A telephone communications assembly, the assembly comprising a switch having at least two extension ports and  
5 at least one trunk line port connectable to the extension ports; and a telephone transmitting and receiving device connected to the or one of the trunk line port(s), the device being adapted for use directly in a public, non-wired communication network.
- 10 2. An assembly according to claim 1, wherein the public, non-wired communication network is a radio communications network.
3. An assembly according to claim 2, wherein the radio communications network is a cellular network.
- 15 4. An assembly according to claim 3, wherein the cellular network is a mobile telephone communication network.
5. An assembly according to any of the preceding claims, wherein the switch includes a second trunk line port connected to another telephone communications network.
- 20 6. An assembly according to claim 5, wherein the switch further comprises a detector for detecting the destination of a call from an extension port and causing the switch to route the call to one or other of the trunk line ports as appropriate.
- 25 7. A telephone communications assembly substantially as hereinbefore described with reference to the accompanying drawing.

**Patents Act 1977****Examiner's report to the Comptroller under Section 17  
(The Search report)**

Application number

GB 9422816.0

**Relevant Technical Fields**

(i) UK Cl (Ed.N) H4K: KF42 H4L: LDJ

(ii) Int Cl (Ed.6) H04M, H04Q

Search Examiner  
AL STRAYTONDate of completion of Search  
10 JANUARY 1995**Databases (see below)**

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE: WPI

Documents considered relevant  
following a search in respect of  
Claims :-  
ALL**Categories of documents**

- X:** Document indicating lack of novelty or of inventive step.      **P:** Document published on or after the declared priority date but before the filing date of the present application.
- Y:** Document indicating lack of inventive step if combined with one or more other documents of the same category.      **E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.
- A:** Document indicating technological background and/or state of the art.      **&:** Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2253119 A (MERCURY) Figures 1b, 1c, 3; page 15, lines 15 to 18	1 to 4

**Databases:** The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).